

010

DC 2-105.

Customer 2

Customer 8  $\frac{2}{102}$  ★

Customer 7  $\frac{2}{102}$  ★

Customers 1, 4 & 5 ★  $\frac{2}{102}$

Customer 62102 ★

DC 1

501

Customers  
1,425

202  
★

Customer 72 ~~★~~

Customer 8 ~~★~~ 2/02

Customer 9 ★ 2/10/2

Customer 3  
★

3

2

0205

Fig. 1A

Example Direct Shipping Cost Database (cost per 5 lbs.)

		112a	112b	112c	...	112d
		Distribution Center ("DC") 1	DC 2	DC 3		DC N
111a	0-5 miles, courier	\$10.00	-	-	...	-
111b	0-150 miles, domestic ground	\$2.25	\$2.00	\$2.00		\$2.00
111c	150-1000 miles, domestic ground	\$3.00	\$2.50	\$2.50		\$3.00
111d	1000-2500 miles, domestic ground	\$4.00	\$3.50	\$3.50		\$4.50
111e	2500+ miles, domestic ground	\$5.00	\$4.50	\$4.50		\$6.00
111f	0-3000 miles, domestic next day air	\$8.50	\$8.50	\$8.50		\$8.00
111g	3000+ miles, domestic next day air	\$12.00	\$12.00	\$12.00		\$11.00
111h	0-3000 miles, foreign air	-	\$19.00	\$19.00		\$20.00
		⋮				

**Figure 1B**

Example Direct Labor Cost Database

		116a	116b	116c	...	116d
		DC 1, Processing Lane 1	DC 1, Processing Lane 2	DC 2, Processing Lane 1		DC N, Processing Lane M
115a	Order Type 1	\$0.50	\$0.50	\$0.75	...	-
115b	Order Type 2	-	\$0.75	\$0.75		-
115c	Order Type 3	\$1.00	-	\$0.75		-
		⋮				
115d	Giftwrapping	-	\$2.00	-		\$2.00
		⋮				

**Figure 1C**

Example Direct Packing Material Cost Database

		120a	120b	...	120c
		DC 1	DC 2		DC N
119a	Order Type 1	\$0.50	\$0.50	...	\$0.50
119b	Order Type 2	\$0.20	\$0.25		-
		⋮			

**Figure 1D**

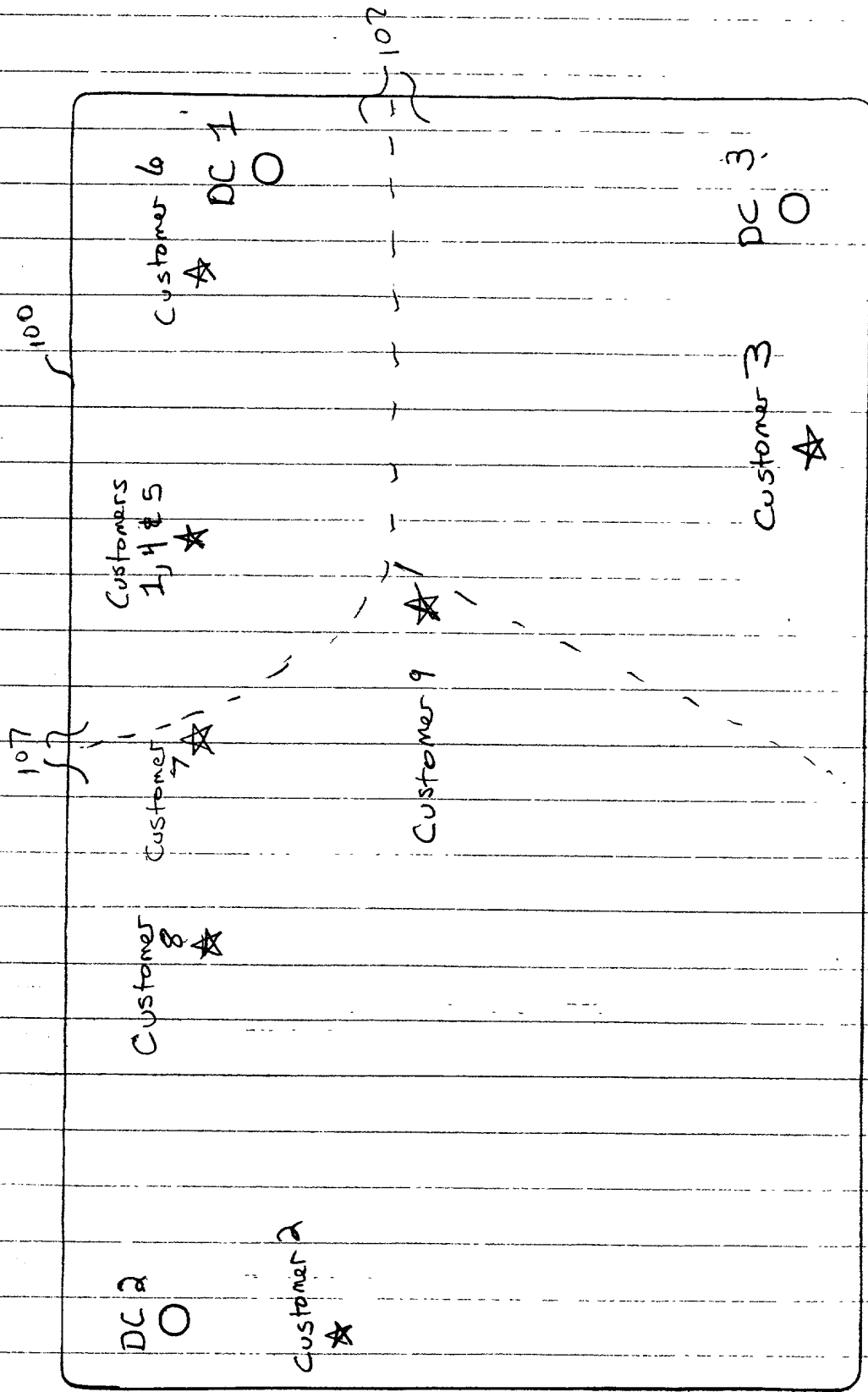


Fig. 7E

Example Estimated Customer Goodwill Cost From Expected Delivery Date Deviation Database

		124a	124b	124c	
		Customer 1	Customer 2	Customer 3	
		⋮			
123a	1 day early	\$-5.00	-	\$-1.00	...
123b	on-time	-	-	\$-0.50	
123c	1 day late	\$2.00	\$2.00	\$1.00	
123d	2 days late	\$5.00	\$2.50	\$1.00	
123e	3 days late	\$10.00	\$3.00	\$2.00	
123f	4 days late	\$25.00	\$5.00	\$1.75	
		⋮			

**Figure 1F**

Example Estimated Customer Goodwill Cost From Expected Order Split Deviation Database

		128a	128b	128c	
		Customer 1	Customer 2	Customer 3	
		⋮			
127a	1 less order split	\$-2.50	-	\$-0.25	...
127b	expected # of order splits	-	-	\$-0.10	
127c	1 more order split	\$0.50	\$0.50	\$0.25	
127d	2 more order splits	\$1.25	\$0.65	\$0.25	
127e	3 more order splits	\$2.50	\$0.75	\$0.50	
127f	4 more order splits	\$6.25	\$1.25	\$0.40	
		⋮			

**Figure 1G**

### Example New Order Optimal Allocation Database

		132a	132b	132c		132d
		DC 1, Processing Lane 1	DC 1, Processing Lane 2	DC 2, Processing Lane 1		DC N, Processing Lane M
		⋮				
131a	7am-8am EST Order Type 1	25	15	60	...	-
131b	7am-8am EST Order Type 2	-	30	10		-
		⋮				
161c	8am-9am EST Order Type 1	25	25	50		-
161d	8am-9am EST Order Type 2	-	30	20		-
		⋮				

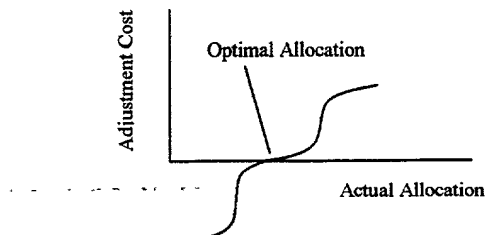
**Figure 1H**

### Example New Order Actual Allocation Differential

		136a	136b	136c		136d
		DC 1, Processing Lane 1	DC 1, Processing Lane 2	DC 2, Processing Lane 1		DC N, Processing Lane M
		⋮				
135a	7am-8am EST Order Type 1	-	+30	-5	...	-
135b	7am-8am EST Order Type 2	-	+5	-5		-
		⋮				

**Figure 1I**

### Example New Order Allocation Adjustment Formula



**Figure 1J**

Example Order Fulfillment Plan Option Comparison (for order by Customer 1 of Type 2 with 2 items)

	140a	140b	140c	140d	140e	140f	140z
	Direct Shipping Cost	Direct Labor Cost	Direct Packing Material Cost	Delivery Date Customer Goodwill Cost	Order Split Customer Goodwill Cost	Allocation Adjustment Cost	Total Cost
139a	both items from DC 1, Processing Lane 2; standard shipping	\$3.00	\$0.75	\$0.20	-	\$0.25	\$4.20
139b	both items from DC 2, Processing Lane 1; standard shipping	\$3.50	\$0.75	\$0.25	-	-\$1.00	\$3.50
139c	item 1 from DC 1, Processing Lane 2; and item 2 from DC 2, Processing Lane 1; standard shipping	\$6.50	\$1.50	\$0.45	\$0.50	-\$0.35	\$8.60
	::						
139d	both items from DC 1, Processing Lane 2; Next Day Air shipping	\$8.50	\$0.75	\$0.20	-\$5.00	\$0.25	\$4.70
	::						

Figure 1K

120

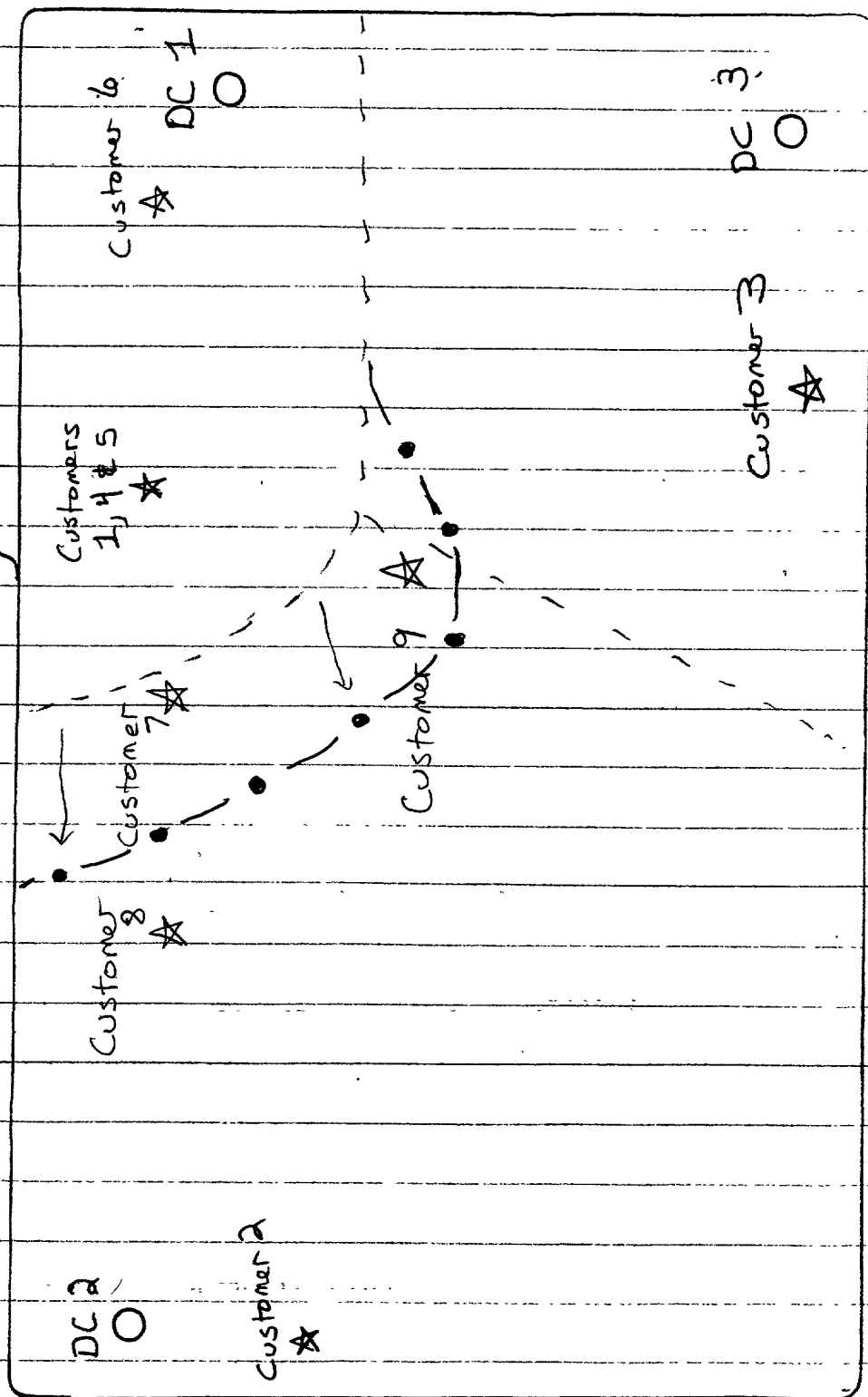


Fig. 77

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A Day Without Rain

~ Enya

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You Save: \$3.49 (14%)

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Fig. 2A



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~ Enya

## Kenny Loggins Alive (1981)



List Price: \$24.98  
Our Price: \$21.49  
You Save: \$3.49 (14%)

### Actual Delivery Information

IF default ordering is used, this item will be shipped from the Seattle distribution center on 09/03/XX and will be received by you on 09/08/XX, with a total cost of \$27.19.

DVD

Rated: NR

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Work-Std Shipping	09/08/XX
Work-Next Day Air	09/04/XX + \$5.50
Home-Std Shipping	09/07/XX - \$0.50
:	:

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Fig. 2B


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Click the "Place your order" button to complete your purchase.

 **Place your order**

#### Shipping to: [Change](#)

Customer 1  
Work  
123 Main St.  
Seattle, WA 98101

#### Shipping Options: [Learn more about shipping prices and policies](#)

☒ Standard Shipping From the Seattle DC  
(09/08/XX - \$3.50)

☐ Next Day Air (09/04/XX - \$8.50)

☐ Standard Shipping + Enhanced Priority  
Processing (09/07/XX - \$5.50)

☐ Next Day Air + Immediate Processing  
(09/03/XX at 10:30am - \$16.50)

☐ Standard Shipping From the Atlanta DC  
(09/08/XX - \$3.85)

☐ Standard Shipping from the Disadvantaged Youth  
Processing Lane (09/07/XX - \$4.50 + \$1.50)

**Kenny Loggins Alive Kenny Loggins (Primary Contributor)**

**\$21.49** - Quantity : 1 Usually ships in 2-3 days

**Gift Options:** None [Change](#)

#### Order Summary

Items:	\$21.49	} 225
Shipping & Handling:	\$3.50	
Total Before Tax:	\$24.99	} 235
Tax:	\$2.30	

**Order Total: \$27.19**

#### Have a gift certificate or promotional code?

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[Change](#)

MasterCard: \*\*\*- 12345

Exp: 12/2003

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Fig. 2C

**Not Yet Shipped:** Item 1 will arrive at the Seattle DC from external inventory storage by 5pm on 09/02/XX, and will be behind approximately 100 orders in a queue of orders ready for processing by Processing Lane 3. Order processing will begin at approximately 8am on 09/03/XX and will be completed by 8:30am on 09/03/XX. The order will be shipped from the DC at me: 09/08/XX approximately 10am on 09/03/XX by ABC Shipping.

**Delivery Time:** 09/08/XX

- Availability: 1 in stock
- Gift-wrap and note: None [Change](#)

Fig. 2D



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You Save: \$3.49 (14%)

Actual Delivery Time:

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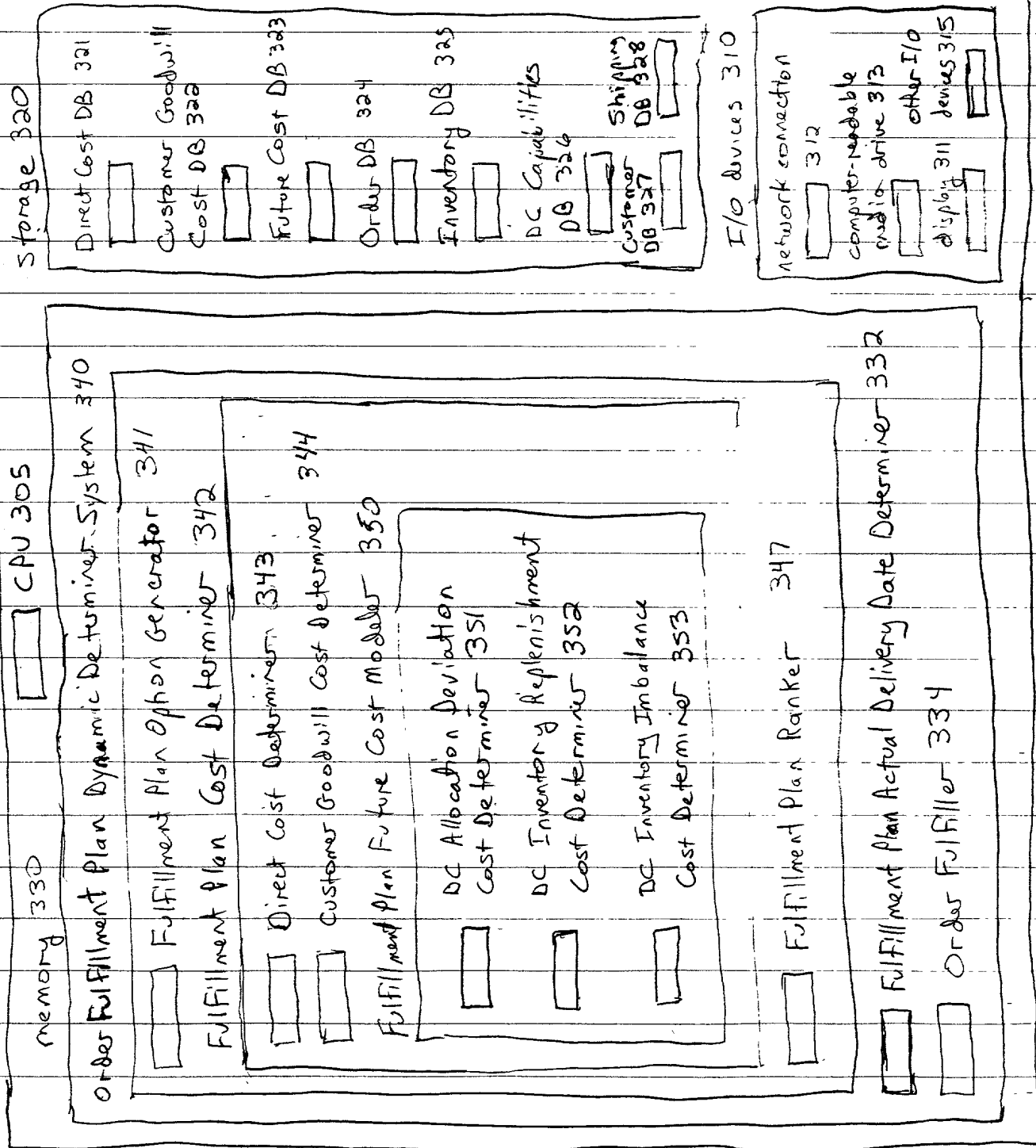
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Fig. 2E

Fig. 3

order fulfillment computer system 300



client computing devices 360

CPU 362  
Storage 366  
I/O devices 364  
memory 367  
browser 369

Web server computing devices 370

memory 375  
server 376  
order placer 377  
Fulfillment Plan Info Obtainer 378  
Option Presenter 379  
storage 374  
available item information 371  
CPU 372  
I/O devices 373

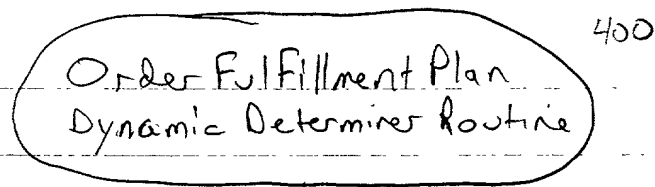


Fig. 4

405  
Receive indication of potential order for customer

410  
Generate Fulfillment plan options

415  
Select next Fulfillment plan option

420  
Determine Fulfillment plan cost

425  
More?

No

430  
Rank fulfillment plans

435  
Provide ranked list of fulfillment plan options

495  
More?

No

499  
END

Fig. 5

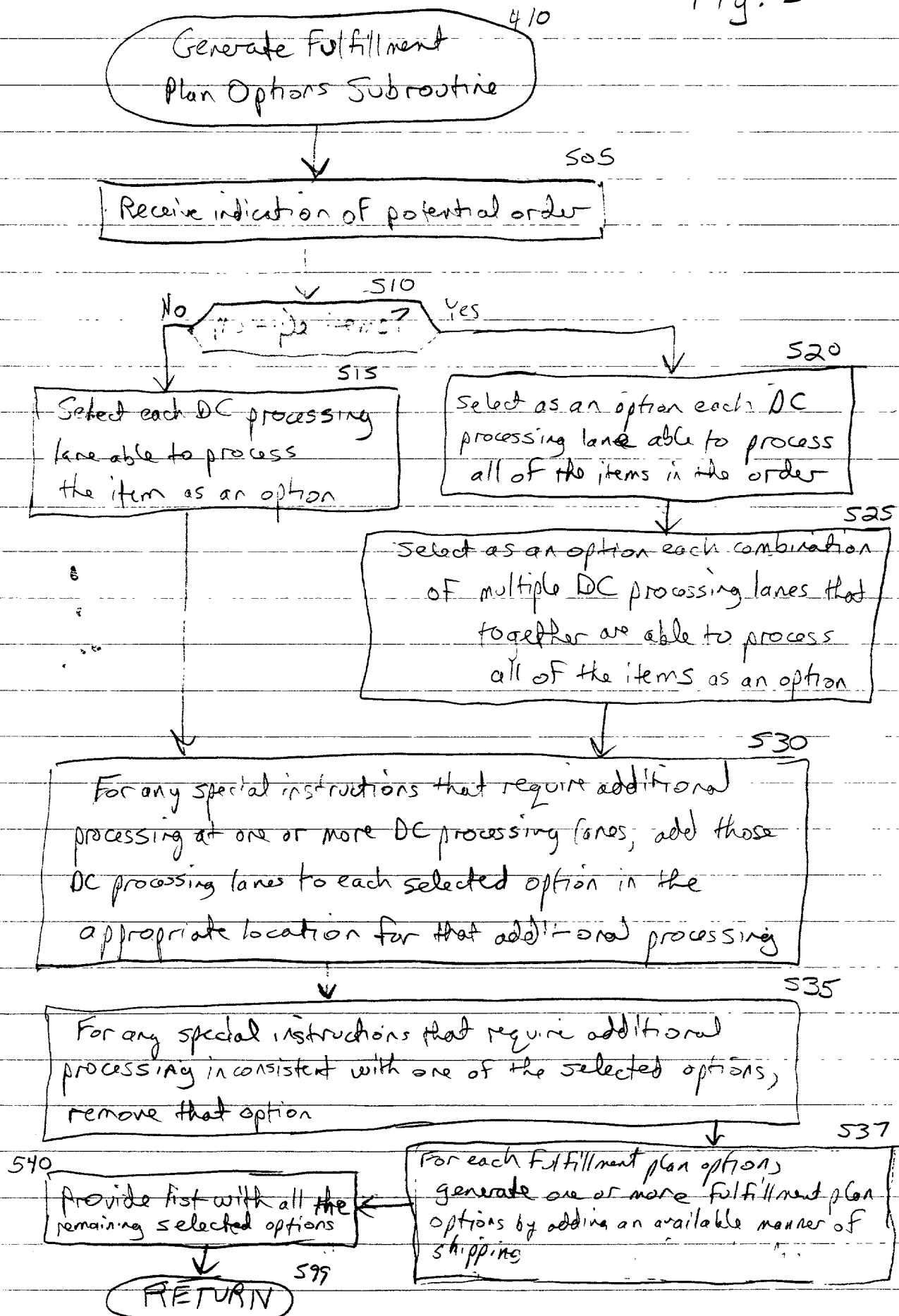
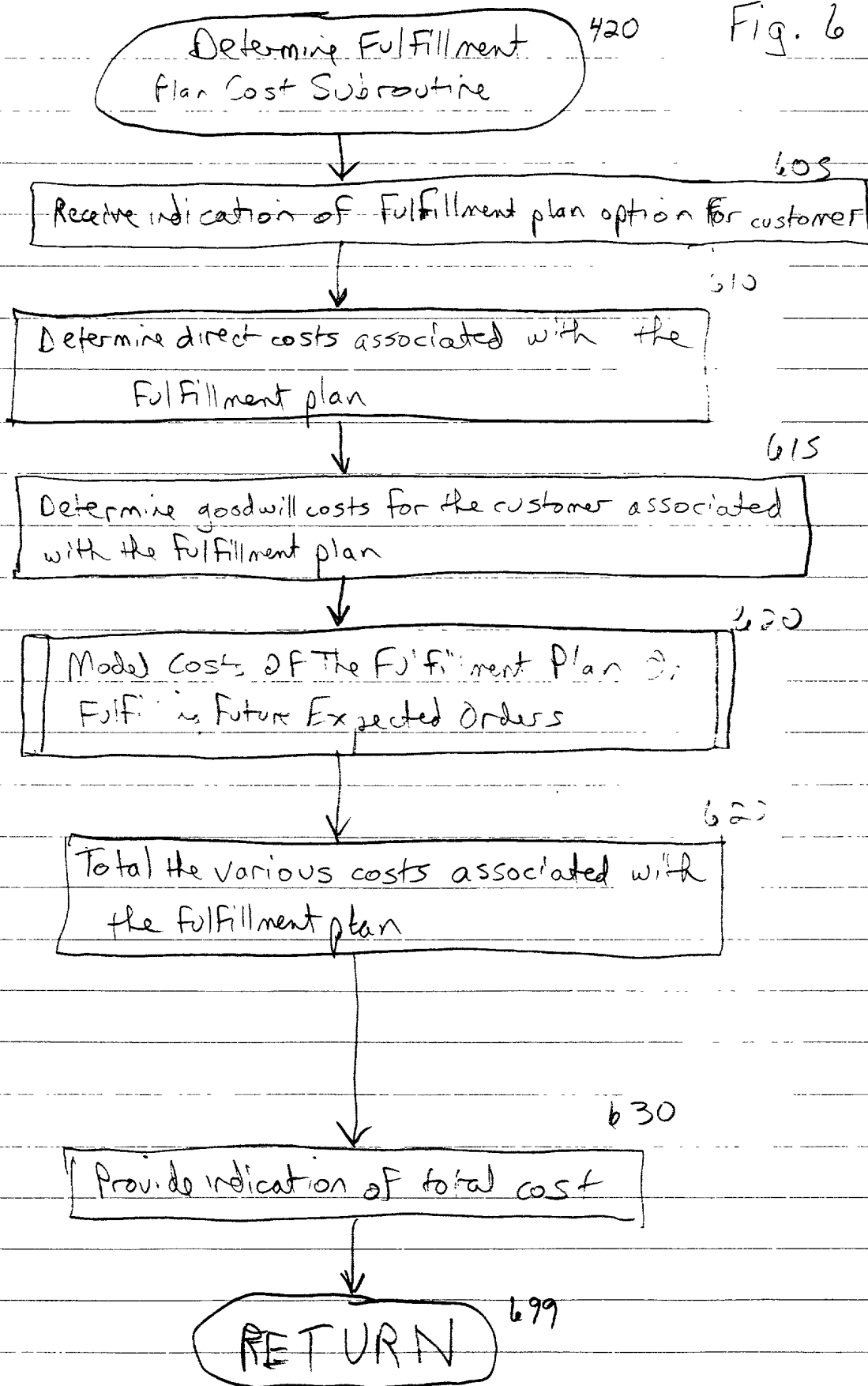
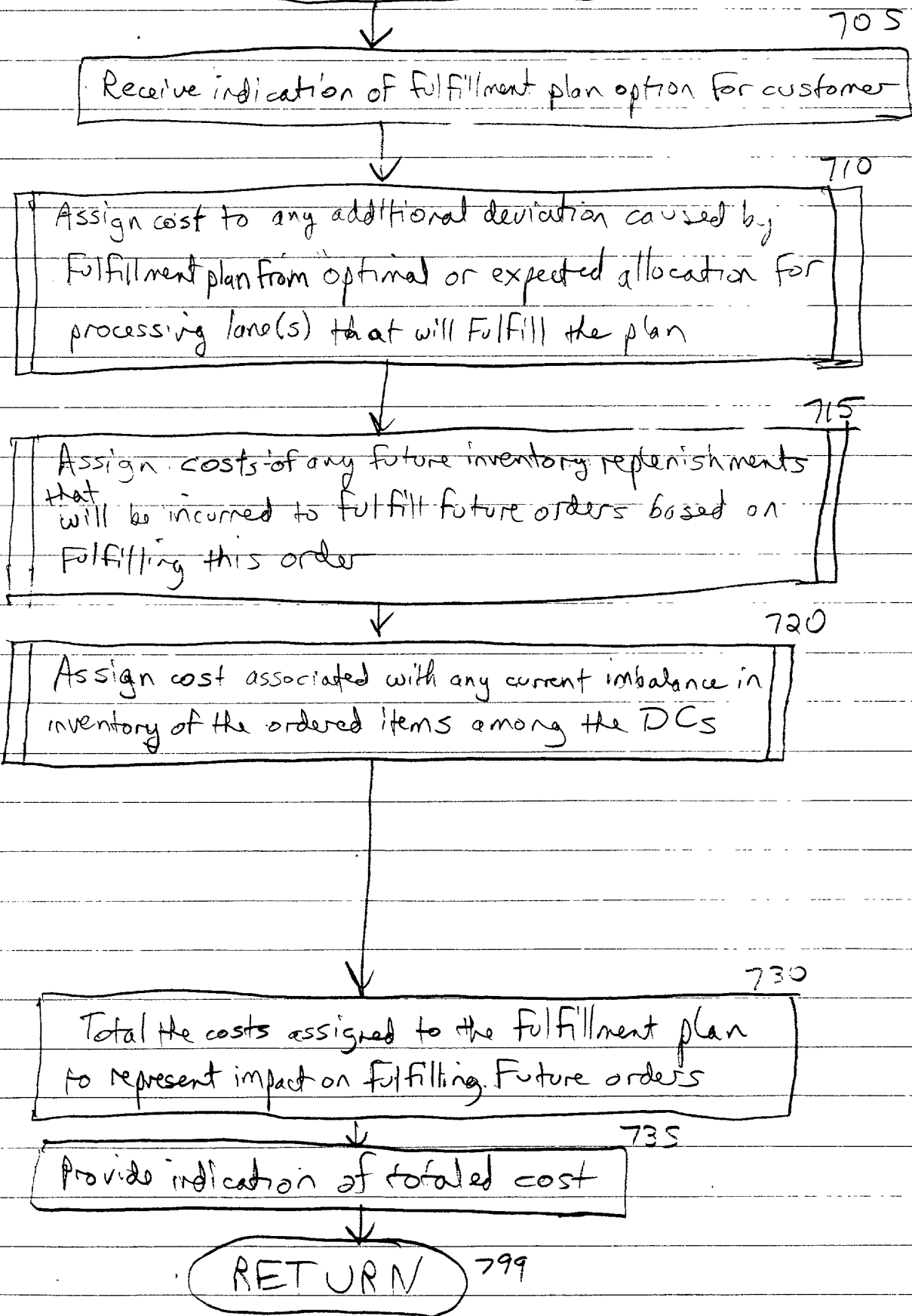


Fig. 6



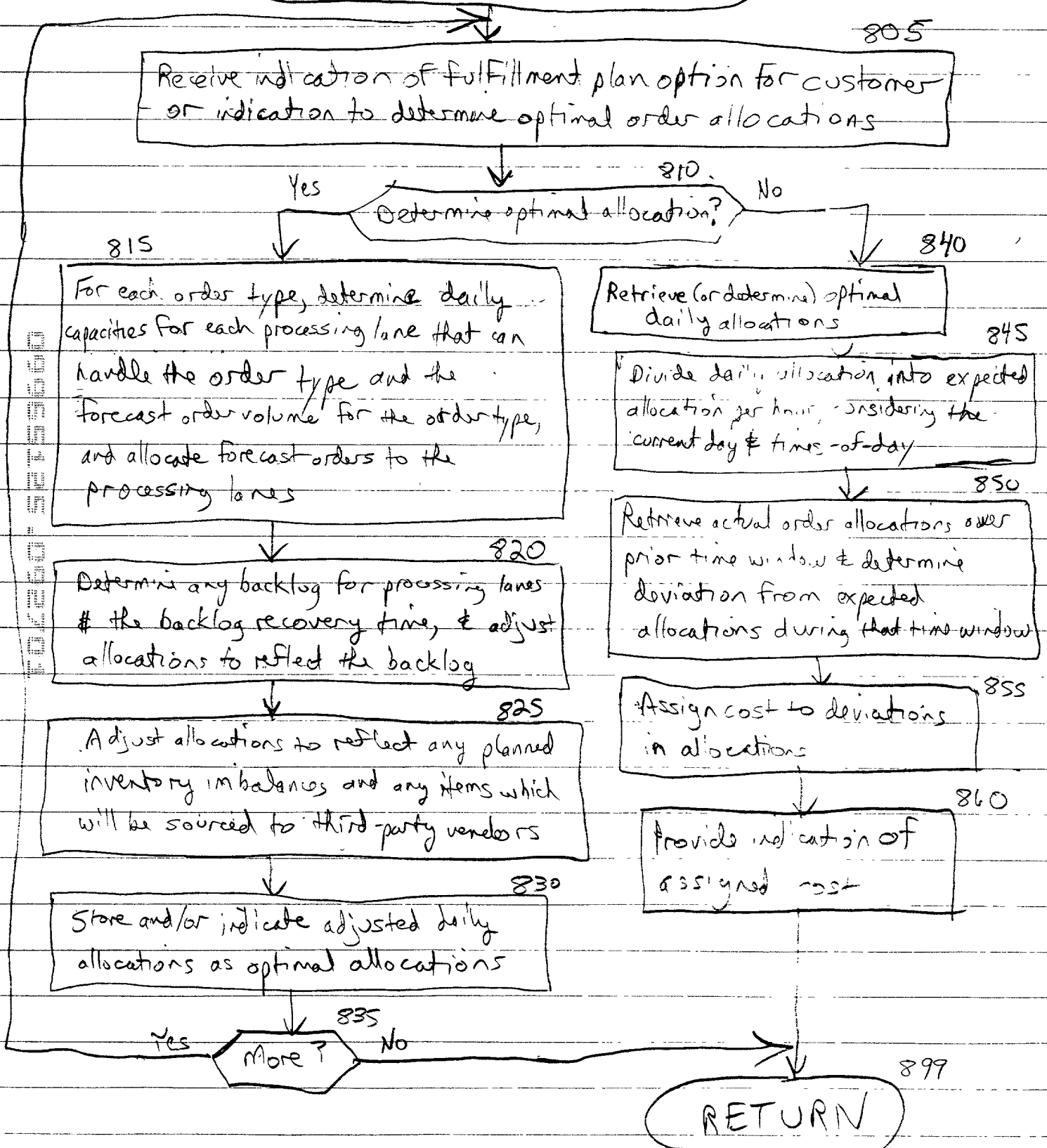


Model Fulfillment Plan Future Costs Subroutine



# Assign Allocation Generation Costs Subroutine

Fig. 8



# Assign Inventory Imbalance Costs Subroutine

905  
Receive indication of fulfillment plan option for customer or indication to determine expected run rates for some or all items

910  
Determine expected run rates?

Yes

No

915

For each item of interest and each DC that supplies the item, determine daily expected run rates for that item in the region typically served by that DC by analyzing historical purchase patterns and considering day-based variations, regional demand, and any other available relevant information

930

Retrieve (or determine) daily expected run rates for each combination of DC and item to be fulfilled from that DC for the fulfillment plan

935

Retrieve actual run rates over prior time window for each item in the order at the DC from which it is to be fulfilled, & determine deviation from expected run rate during that time window for that item at that DC

920

Store and/or indicate daily expected run rates for the items of interest and the DCs

940

Assign cost to deviations in allocations

945

Provide indication of assigned cost

Yes

More?

No

925

999  
RETURN

# Assign Future Inventory Replenishments Costs Subroutine

Receive indication of Fulfillment plan option for customer

Determine default DC for the customer and/or fulfillment plan option

Select next DC that is part of the fulfillment plan

Yes

Default DC?

No

Determine the current inventory and projected run rate at the selected DC for the item(s) to be fulfilled from that DC, and the time of scheduled replenishment of those items

No

Are one or more of the items in-stock now out-expected to go out of stock before replenishment?

Yes

For each such item, assign expected cost of expedited future replenishment for the ordered items and the expected cost of customer goodwill delivery delay for a future order for the ordered items to the fulfillment plan

Yes

More DCs?

No

Total the assigned costs for the fulfillment plan, and provide indication of the total assigned costs

RETURN

1099

1005

1010

1015

1020

1025

1030

1035

1040

1045

430

Fig. 11

Rank Fulfillment  
Plans Subroutine

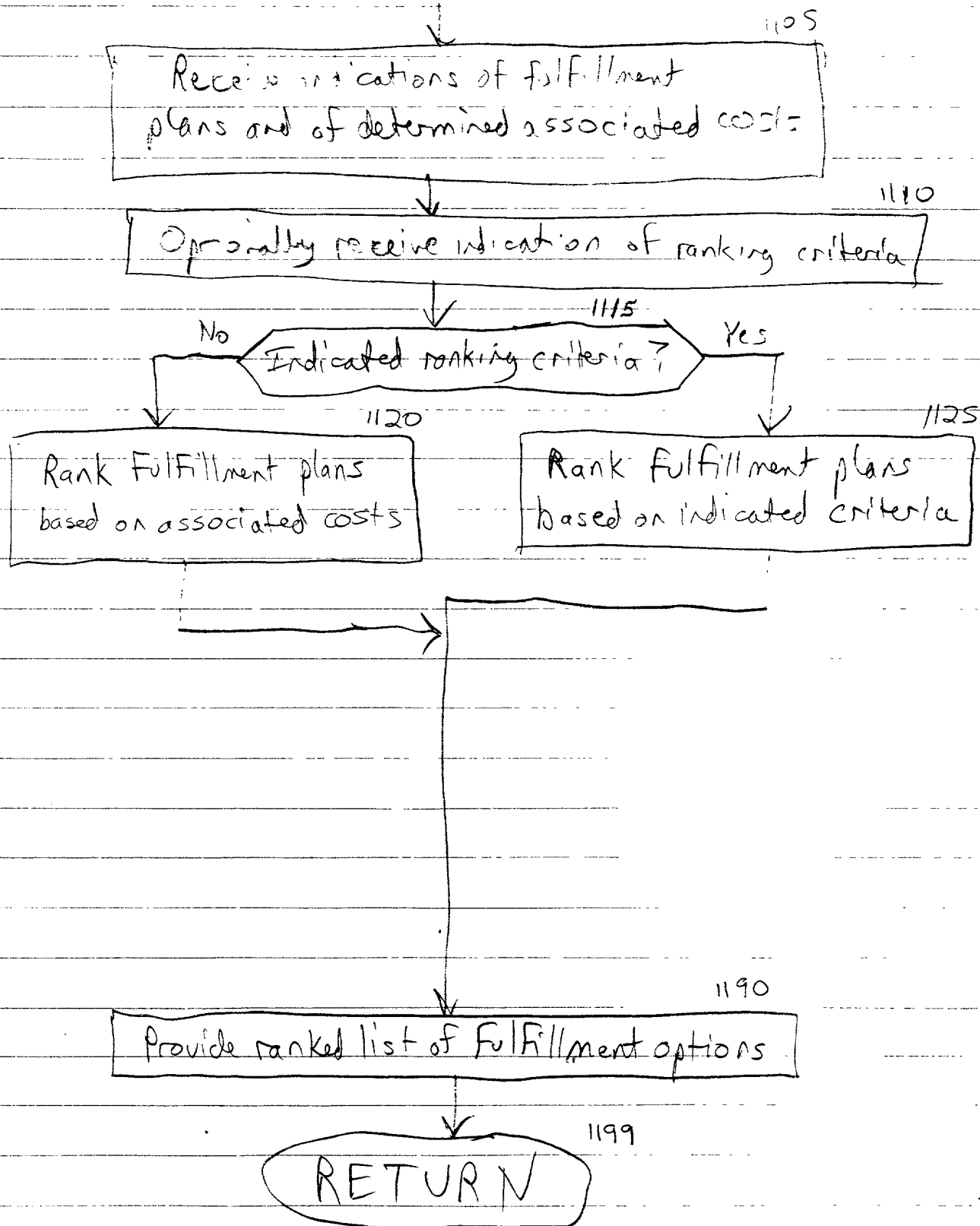


Fig. 12

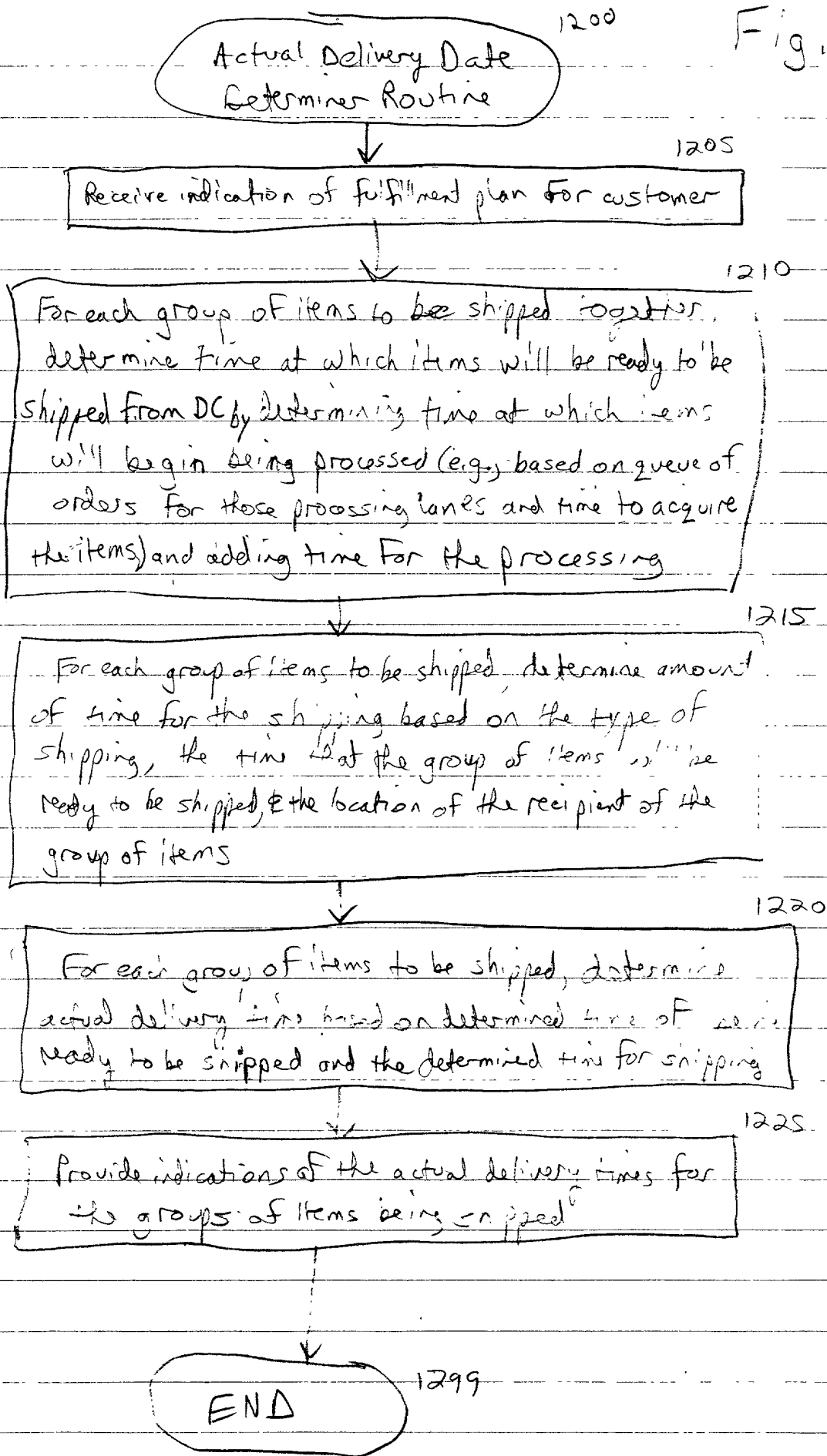


Fig. 13

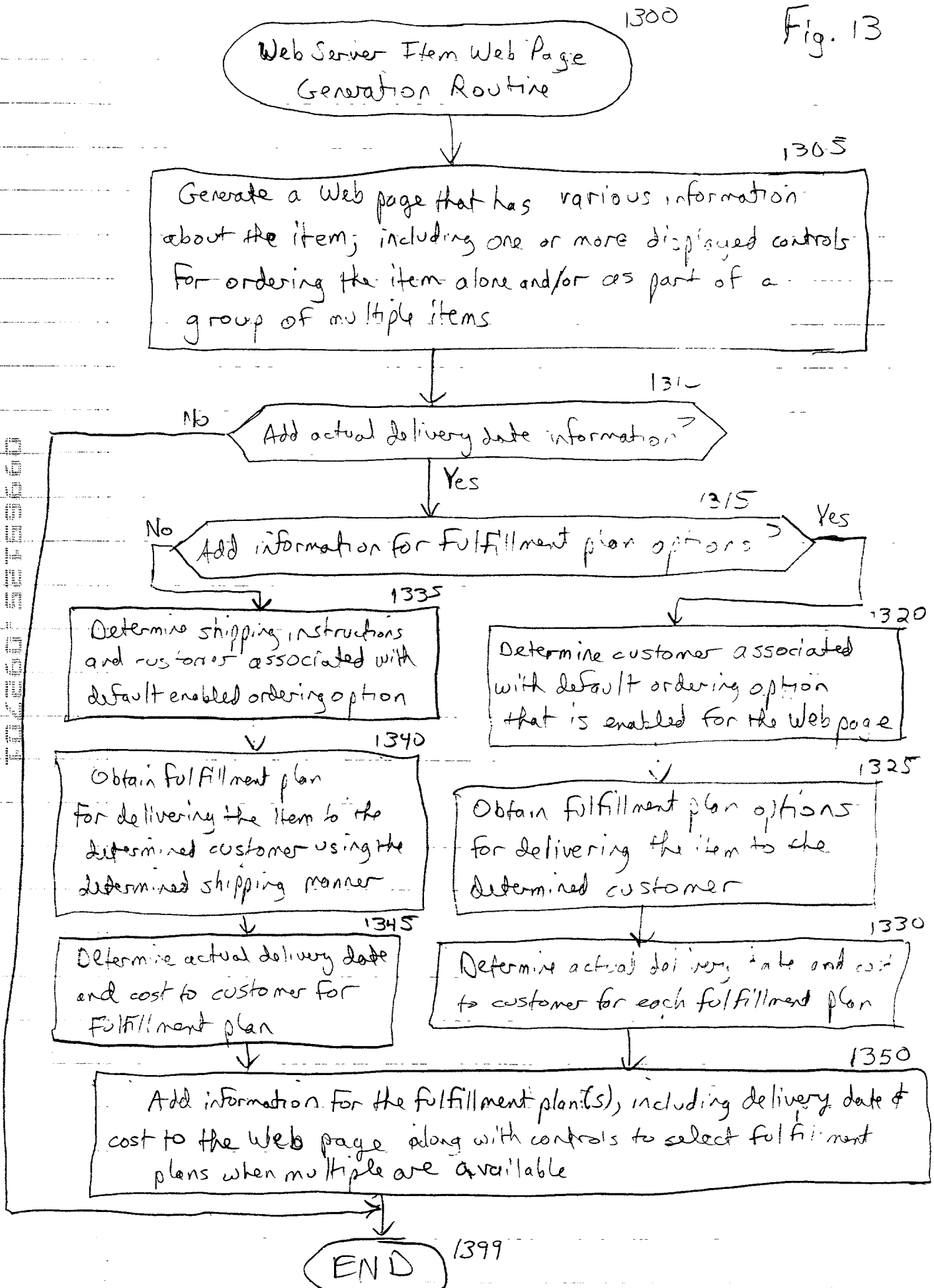


Fig. 14

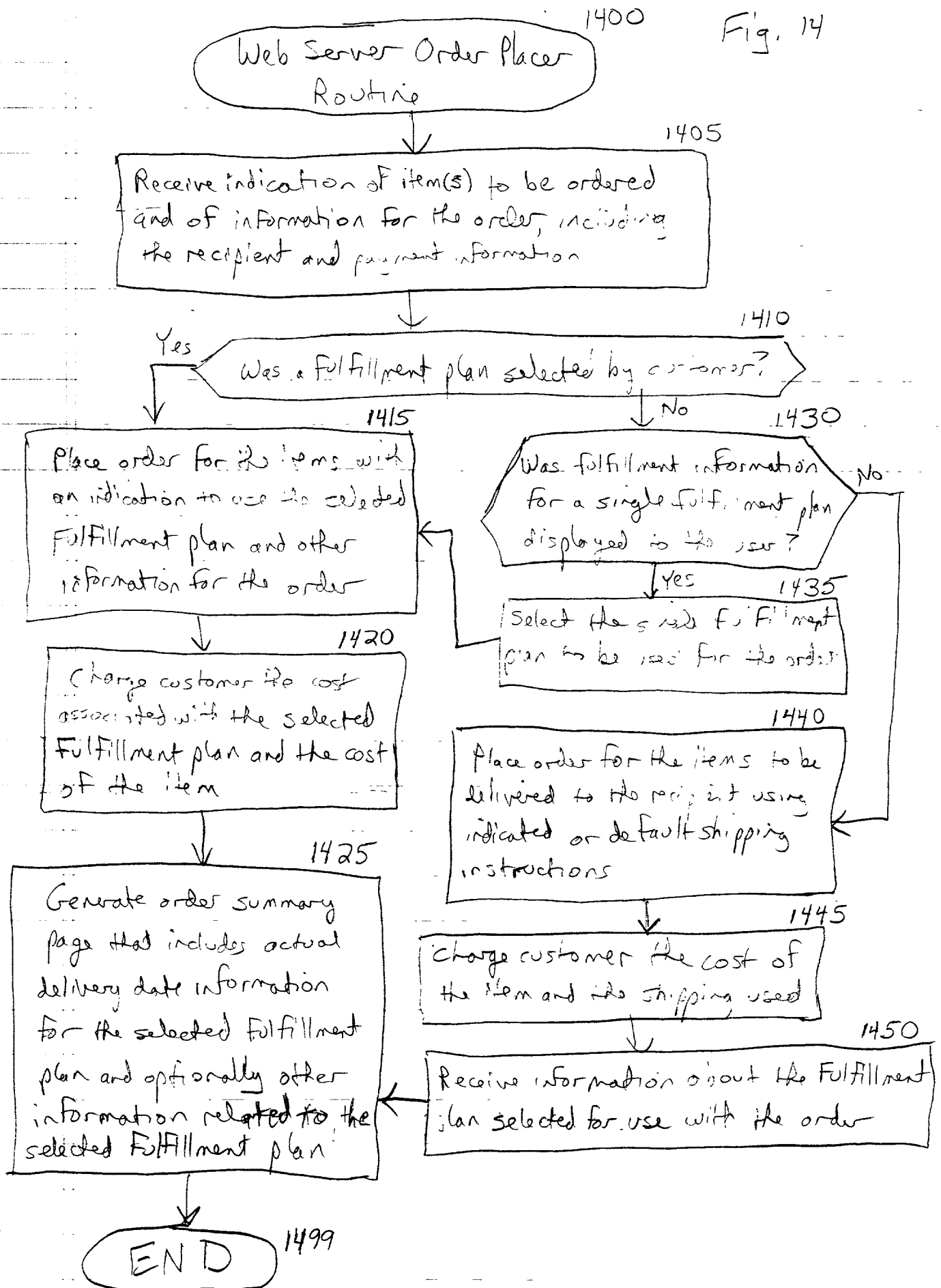
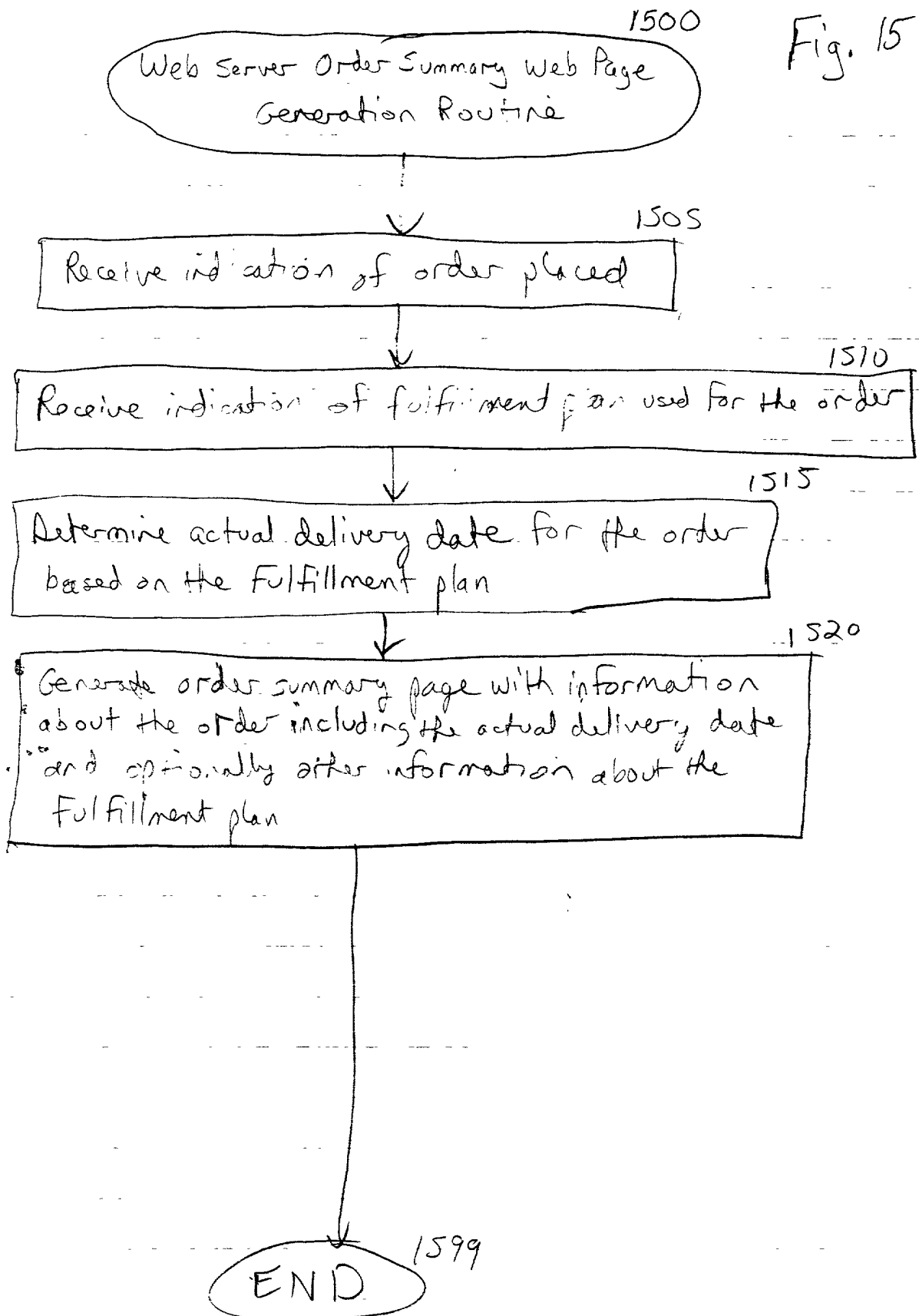




Fig. 15



1600

Fig. 16

Web Server Shopping Cart Web Page  
Generation Routine

1605  
Receive indications of one or more items present  
in the shopping cart

1610  
For each item, determine whether a selected fulfillment plan  
is associated with the item

1615  
For items without associated fulfillment plans, obtain  
fulfillment plan options for the items

1620  
For items with associated fulfillment plans, obtain fulfillment  
plan options for the items other than the associated plans

1625  
Determine actual delivery dates and cost to customers for  
each selected and determined fulfillment plan

1630  
Generate a Web page that has information about each  
of the items and the selected and determined fulfillment  
plans, including actual delivery dates and costs, and that has  
controls to order some or all of the items using any  
fulfillment plans that are then selected

END

1699